Calibration Results of the EBIT Medium-Energy Flat-Field Spectrometer

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We are compiling a catalogue of EUV emission spectra relevant to observations by recently launched satellite observatories [1,2]. Accurate laboratory reproduction of the line emission from astrophysical sources requires a spectrometer with a well-calibrated intensity response. The LBL Advanced Light Source's beamline 6.3.2 was used to calibrate the efficiency of the medium-wavelength flat-field grazing incidence spectrometer [3,4] used on EBIT-II. The spectrometer uses a Hitachi variable-spacing (average 1,200 line/mm) grating developed by Harada and Kita [5,6] and a liquid nitrogen cooled 1"x1" scientific grade Photometrics CCD camera with a resolution of 1,024 x 1,024 pixels.

Several runs were used in this analysis, covering the region from 44 Å to 200 Å; care was taken to ensure that only first-order emissions were used in the analysis. Emision intensity was determined by calculating areas of plotted peaks at each wavelength. Data were then corrected for the intensity of the ALS beamline emission, length of exposure, detector efficiency, and diode responsivity to yield the response function in Fig. 1.

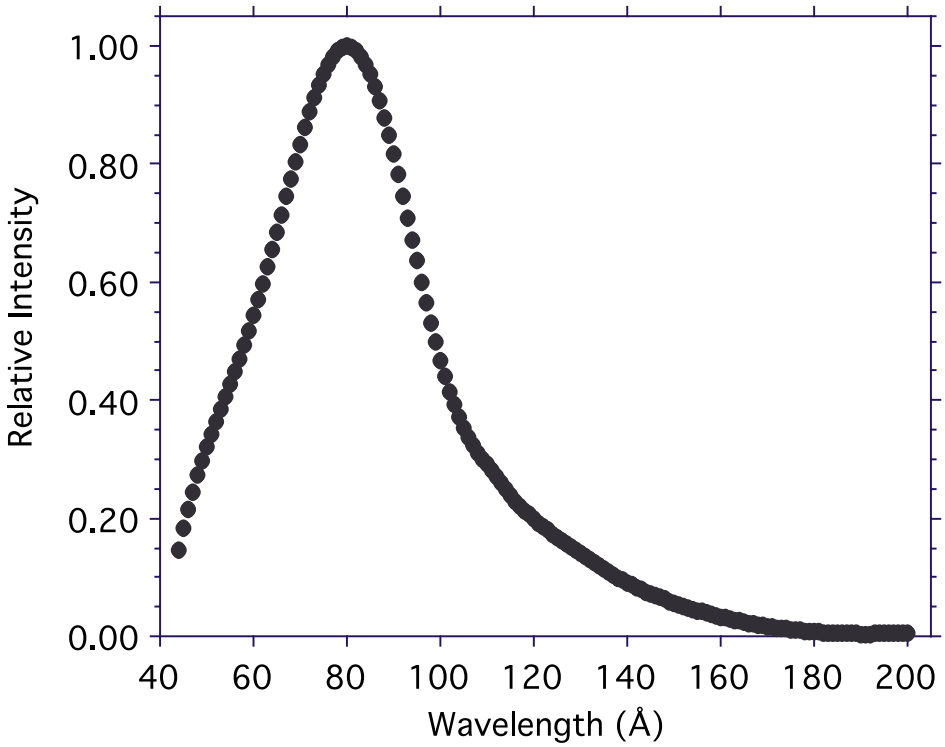

Figure 1. Normalized response function of the Livermore EBIT-II 1200 ℓ/mm flat-field grating spectrometer.

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